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Title: PROCESS FOR THE PREPARATION OF FISH PRODUCTS ;

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ABSTRACT:

The surfaces of individual pieces of fish flesh are softened by treatment for a short time with an aqueous solution, of pH at least 8 and preferably 13, of an alkali metal hydroxide, e.g. sodium hydroxide, or alkali metal salt, e.g. tetrasodium pyrophosphate, trisodium phosphate, sodium carbonate; the treated pieces are then assembled in contact with one another and are maintained at a temperature not exceeding 10 DEG C. until they adhere. The products so obtained may be frozen or deep frozen. For oily fish a surface-active substance may be added to the alkaline solution. According to an example, fillets of lean fish are immersed for 5-10 minutes in a solution of 0.4 per cent sodium hydroxide and 0.6 per cent trisodium phosphate at resin temperature and are then packed in freezing moulds and deep-frozen.

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Process for the Preparation of Fish Products

I, HERMANN BAREZ, a German Citizen, of Neuer Wall 43, Hamburg 36, Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns a process for the production of compact, coherent fish products from individual pieces of fish flesh.

According to the present invention, a process for the production of a compact, coherent fish product comprises softening the surface of individual pieces of fish flesh by treating said surface for a short time with an aqueous solution, having an alkaline reaction of at least pH 8, of an alkali metal hydroxide and/or alkali metal salt, assembling the treated pieces in juxtaposed contact with one another and maintaining the assembly at a temperature not exceeding 10°C. until the individual pieces of fish flesh adhere to one another.

The treatment with the aqueous alkaline solution is preferably carried out by dipping the individual pieces of fish flesh into the solution, which may be strongly alkaline, so that only the surface of the flesh is affected by said treatment. This is in contrast to previously known treatments which involve subjecting the whole of the flesh for a prolonged period to a substantially neutral solution.

The surface is somewhat softened by the treatment with the alkaline solution according to the invention, but not to such an extent as to cause the pieces of fish flesh disposed side by side and one above the other, to stick together initially. The firm adhesion occurs only after a space of time, during which the pieces of fish flesh thus treated are held together at a temperature not exceeding 10°C. This low temperature ensures that the fish flesh is not damaged by the treatment. The adhesion is maintained even

when the fish products thus prepared are boiled or fried for consumption.

Preferably according to the invention, the pieces of fish flesh, which have been surface-treated and disposed one above the other and side by side, are subjected to a freezing process, in which the freezing temperature may be, for example, about -5°C. In a particularly convenient process according to the invention, the freezing is carried out in the form of a deep freeze in which the fish products are frozen throughout in a maximum of two hours. The duration of the freezing in the deep-freezing apparatus has some effect upon the degree of adhesion obtained between the pieces of fish. The temperature in the deep-freezing apparatus should be as low as possible, and preferably should not be above -20°C.

The alkaline aqueous solution should be chosen so that it has a sufficiently intensive action to soften the surface in a short time, but on the other hand should not be so active that it has any detrimental effect on the flavour of the fish.

The alkaline solution may contain an alkali metal hydroxide and/or an alkaline-reacting salt and in the latter case the salt employed is preferably a phosphate. Potassium and sodium hydroxides and salts are preferred and though potassium and sodium have substantially the same reaction activity, the sodium compounds have proved more suitable for carrying the invention into effect.

Specifically preferred salts are tetra-sodium pyrophosphate or tertiary sodium phosphate (trisodium phosphate). Alternatively, a potassium phosphate and more especially tertiary potassium phosphate may be employed. Instead of using either a caustic soda solution or a phosphate, sodium carbonate or potassium carbonate may be employed and, of these, sodium carbonate solution is preferable, because it has a higher hydrogen ion concentration.

The pH value of the alkaline solution is at least 8 and is preferably of the order of 13. Thus, a 1/10 normal caustic soda solution is suitable.

5 Where the fish to be treated is oily, a surface-active agent (wetting agent) is preferably added to the treatment bath. The amphoteric soaps (alkylaminoethylglycines) and fatty alcohol sulphonates are especially suitable for this purpose.

EXAMPLE I

Fillets of lean fish are immersed for a period of 5-10 minutes in a solution of 0.4% of NaOH + 0.6% of Na_2PO_4 at room temperature, and are then packed in freezing moulds and deep-frozen.

EXAMPLE II

Fillets of lean fish are immersed for a period of 5-10 minutes in an 0.6% NaOH solution at room temperature, and are then packed in freezing moulds and deep-frozen.

EXAMPLE III

Fillets of oily fish are immersed for a period of 5-10 minutes at room temperature in a solution as in Example I or II, containing in addition 0.6% of surface-active substance and then packed in freezing moulds and deep-frozen.

While in this invention all alkali metal hydroxides and alkaline-reacting salts may be employed in carrying out the process, in practice only sodium and potassium hydroxides and salts are likely to be used, though the corresponding lithium compounds, for example, could also be used.

What I claim is:—

1. Process for the production of a compact, coherent fish product which comprises softening the surface of individual pieces of fish flesh by treating said surface for a short time with an aqueous solution, having an alkaline reaction of at least pH 8, of an alkali metal hydroxide and/or an alkali metal salt, assembling the treated pieces in juxtaposed contact with one another and

maintaining the assembly at a temperature not exceeding 10 C. until the individual pieces of fish flesh adhere to one another.

2. Process according to Claim 1, wherein the assembly is subjected to a freezing process.

3. Process according to Claim 2 wherein the assembly is subjected to deep freezing.

4. Process according to any of Claims 1 to 3 wherein the alkaline aqueous solution has a pH value of about 13.

5. Process according to any of Claims 1 to 4 wherein the salt employed is a phosphate.

6. Process according to any of Claims 1 to 5 wherein a hydroxide or a salt of potassium or of sodium, preferably the latter, is employed.

7. Process according to any of Claims 1 to 6 wherein the salt employed is tetrasodium pyrophosphate ($\text{Na}_4\text{P}_2\text{O}_7 \cdot 10 \text{H}_2\text{O}$) or tertiary sodium phosphate (Na_3PO_4) (trisodium phosphate).

8. Process according to any of Claims 1 to 6 wherein the salt employed is a potassium phosphate, preferably tertiary potassium phosphate (K_3PO_4).

9. Process according to any of Claims 1 to 4, wherein the salt employed is sodium carbonate ($\text{Na}_2\text{CO}_3 \cdot 10 \text{H}_2\text{O}$) or potassium carbonate (K_2CO_3).

10. Process according to any of Claims 1 to 9, more especially for the treatment of oily fish, wherein a solution of surface-active substances is added to the aqueous alkaline solution.

11. A process according to Claim 1 substantially as set forth in any of Examples I-III hereinbefore set forth.

12. A compact, coherent fish product produced by any of the processes hereinbefore described and claimed.

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